Lesson: **1-3 Proportional Reasoning**

Concept / Topic: Ratios, Rates, Proportions

**General Outcome(s**): Develop number sense and critical thinking skills

 **Specific Outcome(s):** Number #1 – Solve problems that involve unit pricing and currency exchange, using proportional reasoning.

**Required Materials:** Whiteboards, whiteboard markers, windows, smartboard

**Corresponding Text:** *Lesson 1.1 Proportional Reasoning*  Page 12 – 22

Anticipatory Set (Lead-In -): How is it possible to add 4 to 9 and come up with 1?

Answer: On a clock or a calendar

**Procedures This is a two day lesson**

1. Have students pickup their time sheets and fill in the date and the start time. Each Monday, they also choose a new occupation from the occupation cards and list the occupation and the wage on their time sheet.
2. Start the lesson by asking the students if they know what a **comparison** is. If no answers come up, then put a simple example of a math comparison like 3 boxes with 2, 3, and 4 circles in them and ask the students to tell you which box have the **most** circles. Then ask how they got their answer to see if they have an understanding of comparisons. After this initial discussion, have all the students get up and grab a whiteboard marker and find a space on a board or even at the window and put down a comparison of some sort and sit down.
3. Go around to each example and talk about how they are comparisons. If there is an example of a ratio, written in mathematical form a/b or a : b, stop and ask if the students can tell you what this is and how did they know that. If there is not an example of a ratio, after you have gone around and talked about the different answers, then go to the smartboard and put one up and ask if this is a comparison and why.

The example I will use is this:

Jeannine has a bag with 3 videocassettes, 4 marbles, 7 books, and 1 orange.

What is the ratio of books to marbles.

1. Put up the definition of **ratio and of rates located in the smartboard notes** and talk about them and have the students put these definitions and examples in their **foldables** which they put together in a previous lesson. You can discuss reducing the ratio or fraction to lowest terms here as well.
2. Go to the examples that the students put up and using the definitions, see if the examples are ratios or rates stressing that order matters and give the example that you can drink 1 out of 5 cans of pop but cannot drink 5 out of 1 cans of pop.
3. Put up on the smartboard the definitions **of proportion located in the smartboard notes** and have the students take it down in their foldables. Talk about how proportions are a statement which contains 2 equivalent ratios in fraction form and how we can solve for unknowns in these types of situations.
4. Go through some examples of how proportions are used in a variety of trades:
	* Chef(comparing recipes)
	* Painter(mixing paints for larger rooms)
	* Mechanic(mixing oils)
	* Carpenter(comparing room sizes from blueprints)
	* Plumber(comparing sizes of pipes)
	* Office administrator(typing words)
5. Give some examples and have the students go through them and tell you how they got their answer. Some examples are:
* 1/3 = 4/x
* 2/5 = x/10
* 1/6 = 3/x
* 3/7 = x/14
* 3 apples/1 pie so, ? apples/5 pies
* 1/8 = x/18
* 2/7 = 5/x
1. Drill and Practice questions
* #1 – 15, page 1-2
1. The students will now look at some word problems. Put these questions on the smartboard and have the students attempt to answer them, before asking one of the students to describe what they did.
* If a secretary types 60 words per minute, how long will it take her or him to type a 2500-word report for their boss?
* The ratio between Sue’s height and the height of her brother Ted is 5:6. If Ted is 145 cm tall, how tall is Sue, to the nearest centimeter?
* If you need some others, you can look at Pg. 21 #6-8
1. Independent Practice
* L1 Homework Handout
* Duotang Pg 1-3 #1-20
1. Students fill in the end time and the total minutes for the class. If it is Friday, they also fill in the total minutes for the week and convert this to work hours using the ratio ten mins of class time equals 1 hour of work time.